Fig.1

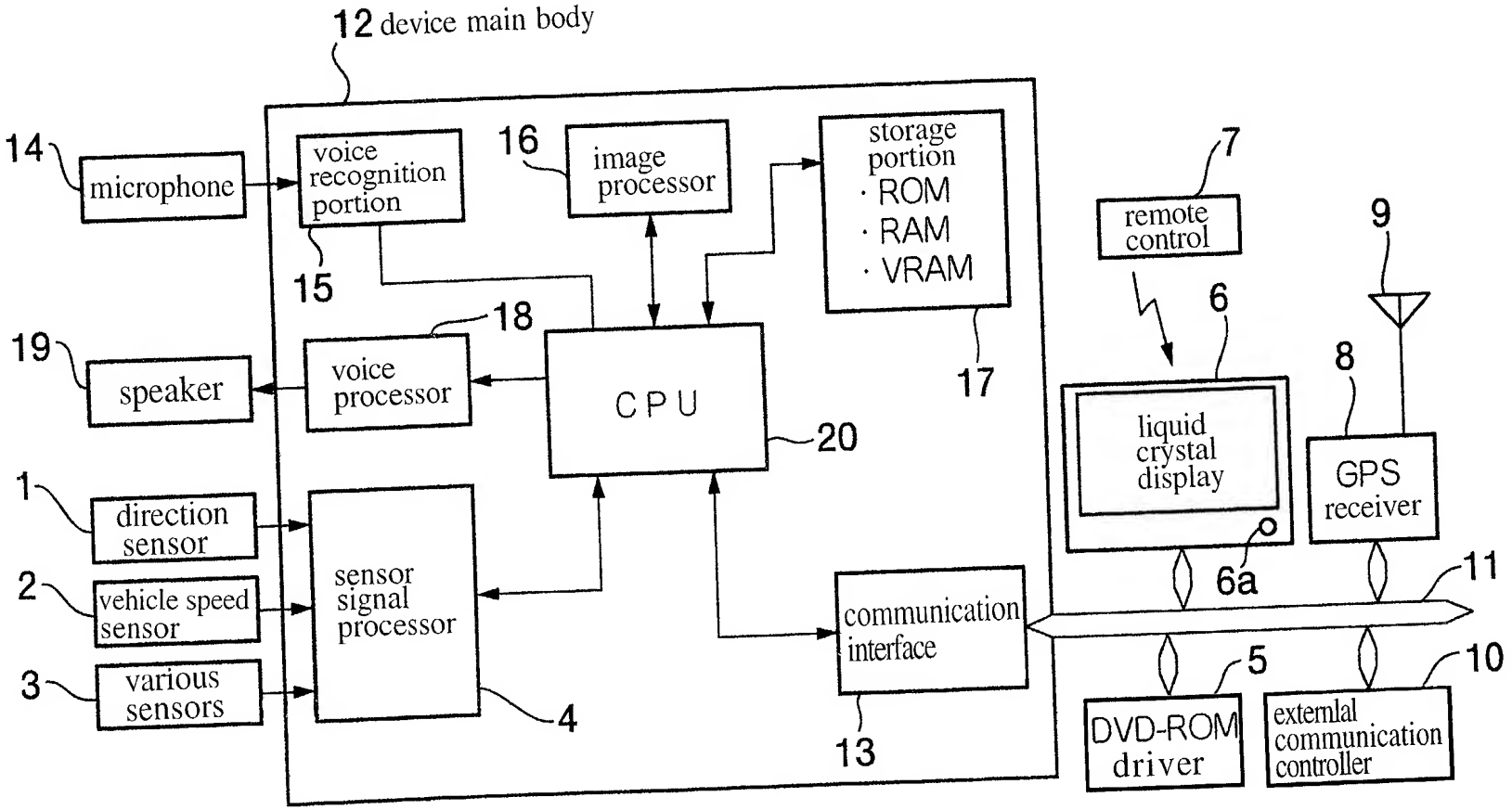

12 device main body
14
microphone
voice recognition portion
15
16
image processor
storage portion
· ROM
· RAM
· VRAM
17
7
remote control
9
6
8
19
speaker
voice processor
18
CPU
20
liquid crystal display
GPS receiver
1
direction sensor
2
vehicle speed sensor
3
various sensors
sensor signal processor
4
communication interface
13
6a
11
5
10
DVD-ROM driver
externlal communication controller

Fig.2

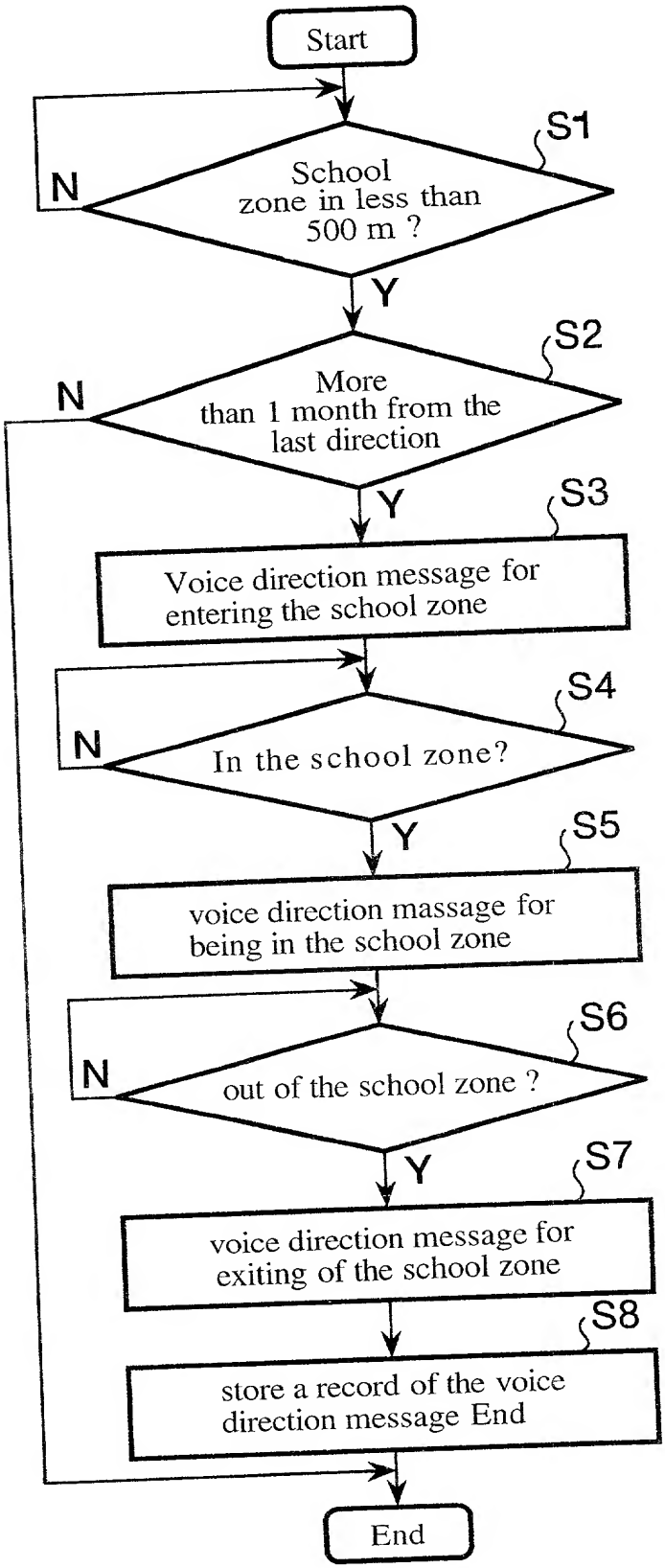

Start
S1
School zone in less than 500 m ?
N
Y
S2
More than 1 month from the last direction
N
Y
S3
Voice direction message for entering the school zone
S4
In the school zone?
N
Y
S5
voice direction massage for being in the school zone
S6
out of the school zone ?
N
Y
S7
voice direction message for exiting of the school zone
S8
store a record of the voice direction message End
End

Fig.3

Setting for the voice direction sbout facilities

- ☐ output every time
- ☐ output sometimes
  - ☐ output regularly
    - ☐ once in (how many) times
    - ☐ once in (how many) weeks
  - ☐ output irregularly

Fig.4

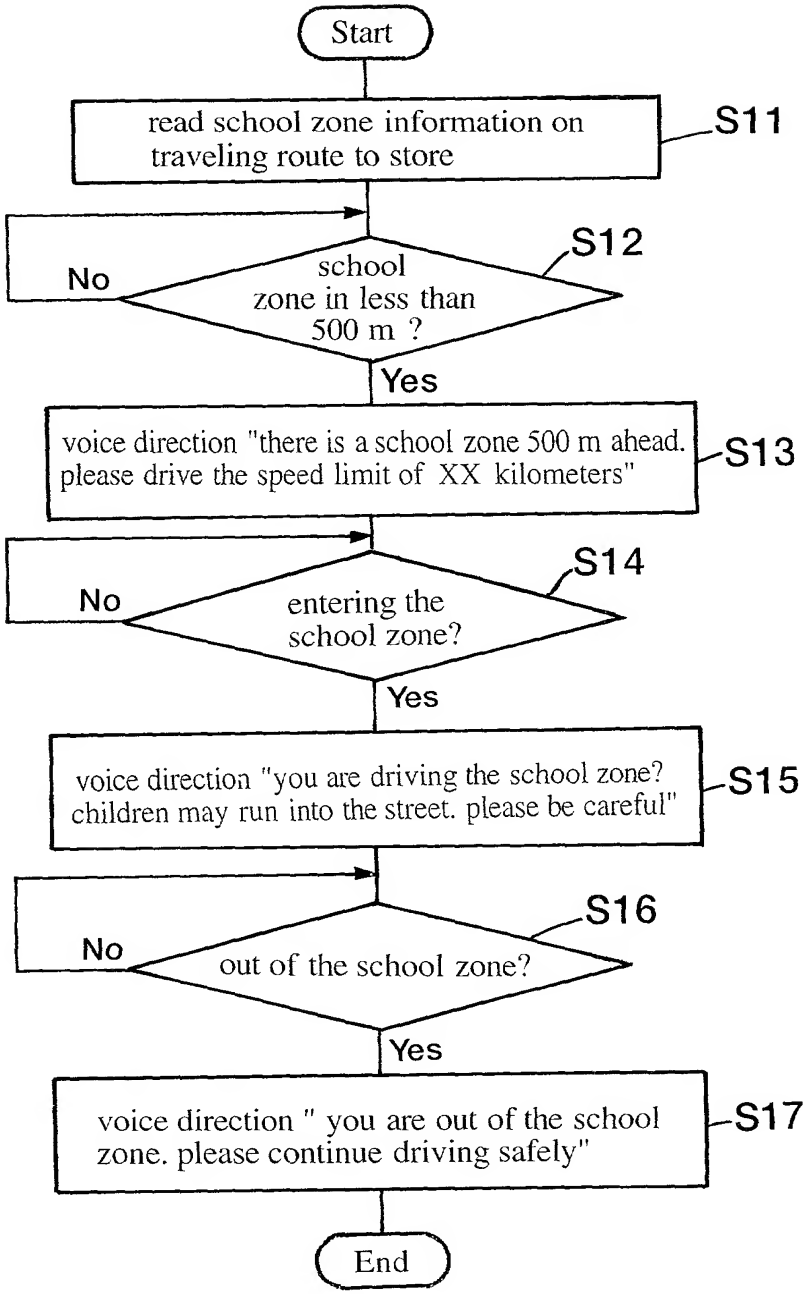

Start
read school zone information on traveling route to store
S11
S12
No
school zone in less than 500 m ?
Yes
voice direction "there is a school zone 500 m ahead. please drive the speed limit of XX kilometers"
S13
S14
No
entering the school zone?
Yes
voice direction "you are driving the school zone? children may run into the street. please be careful"
S15
S16
No
out of the school zone?
Yes
voice direction " you are out of the school zone. please continue driving safely"
S17
End

Fig.5

School zone No.	School name	address	school days	time zone	Speed Limit
1	○○elmentary school	~state~county ○○city	Jannary 8,9,10···· February1,2,3 ····	Mon~SatAM8:00~9:00 Mon~SatPM2:00~4:00	20Km/h
2	△△middle school	~state~county △△city	Jannary 8,9,10···· February1,2,3 ·····	Mon~SatAM7:30~8:30 Mon~SatPM3:30~5:30	30Km/h
3	××elmentary school	~state~county ××city	Jannary 8,9,10···· February1,2,3 ····	Mon~SatAM8:00~9:00 Mon~SatPM2:00~4:00	15Km/h

Fig.6

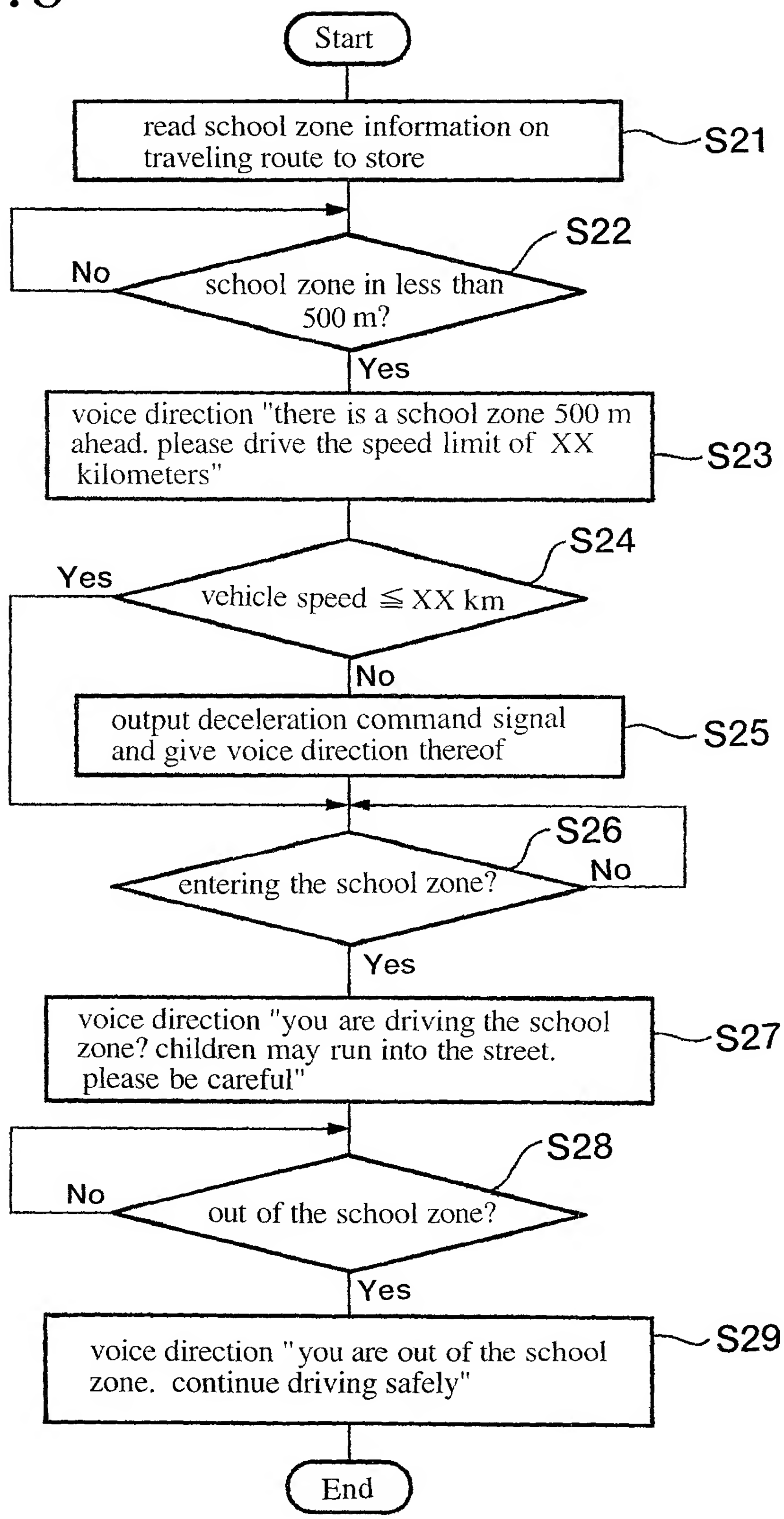
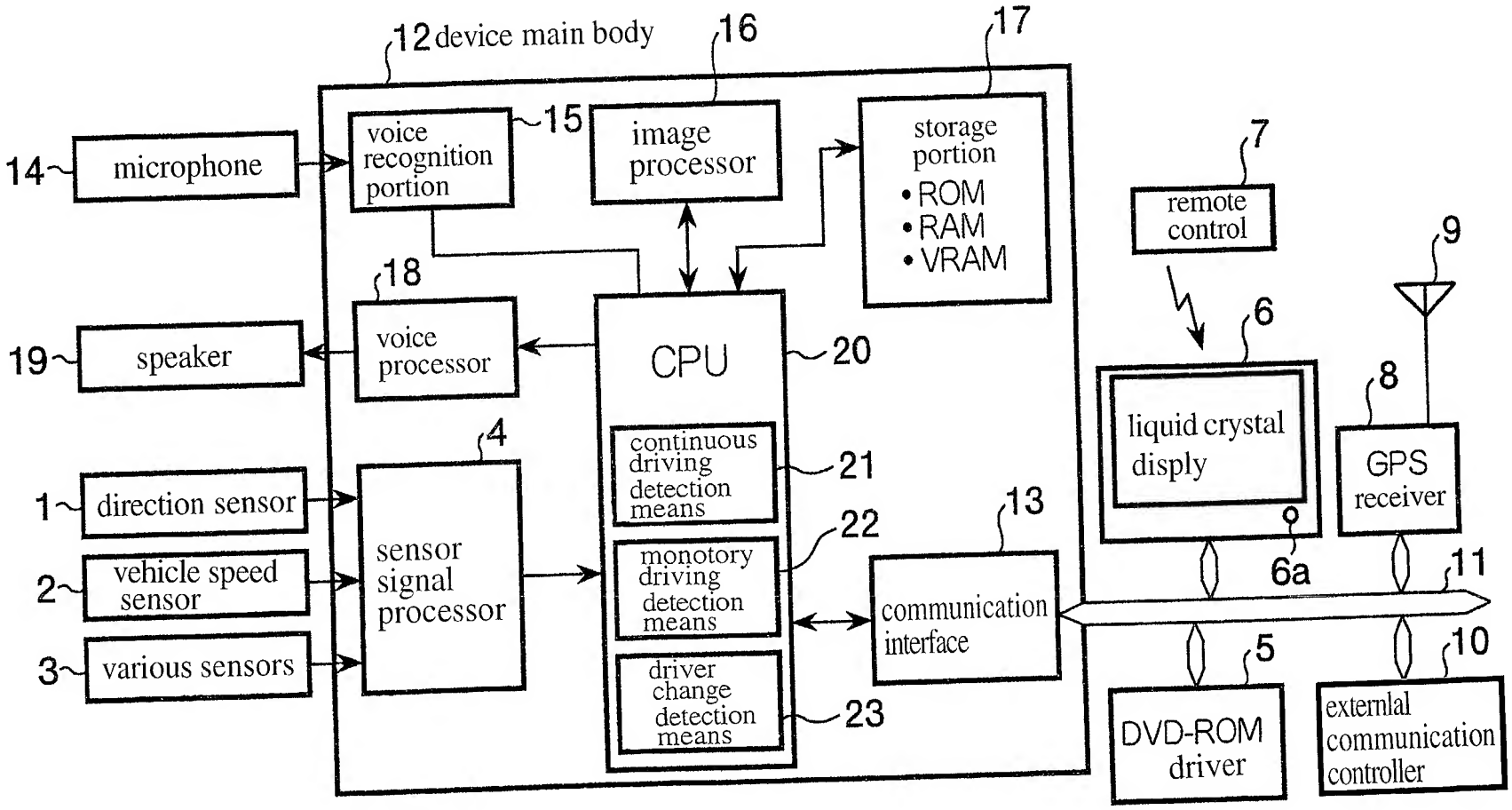

Start
read school zone information on traveling route to store
S21
school zone in less than 500 m?
S22
No
Yes
voice direction "there is a school zone 500 m ahead. please drive the speed limit of XX kilometers"
S23
vehicle speed ≦ XX km
S24
Yes
No
output deceleration command signal and give voice direction thereof
S25
entering the school zone?
S26
No
Yes
voice direction "you are driving the school zone? children may run into the street. please be careful"
S27
out of the school zone?
S28
No
Yes
voice direction "you are out of the school zone. continue driving safely"
S29
End

Fig.7


12 device main body
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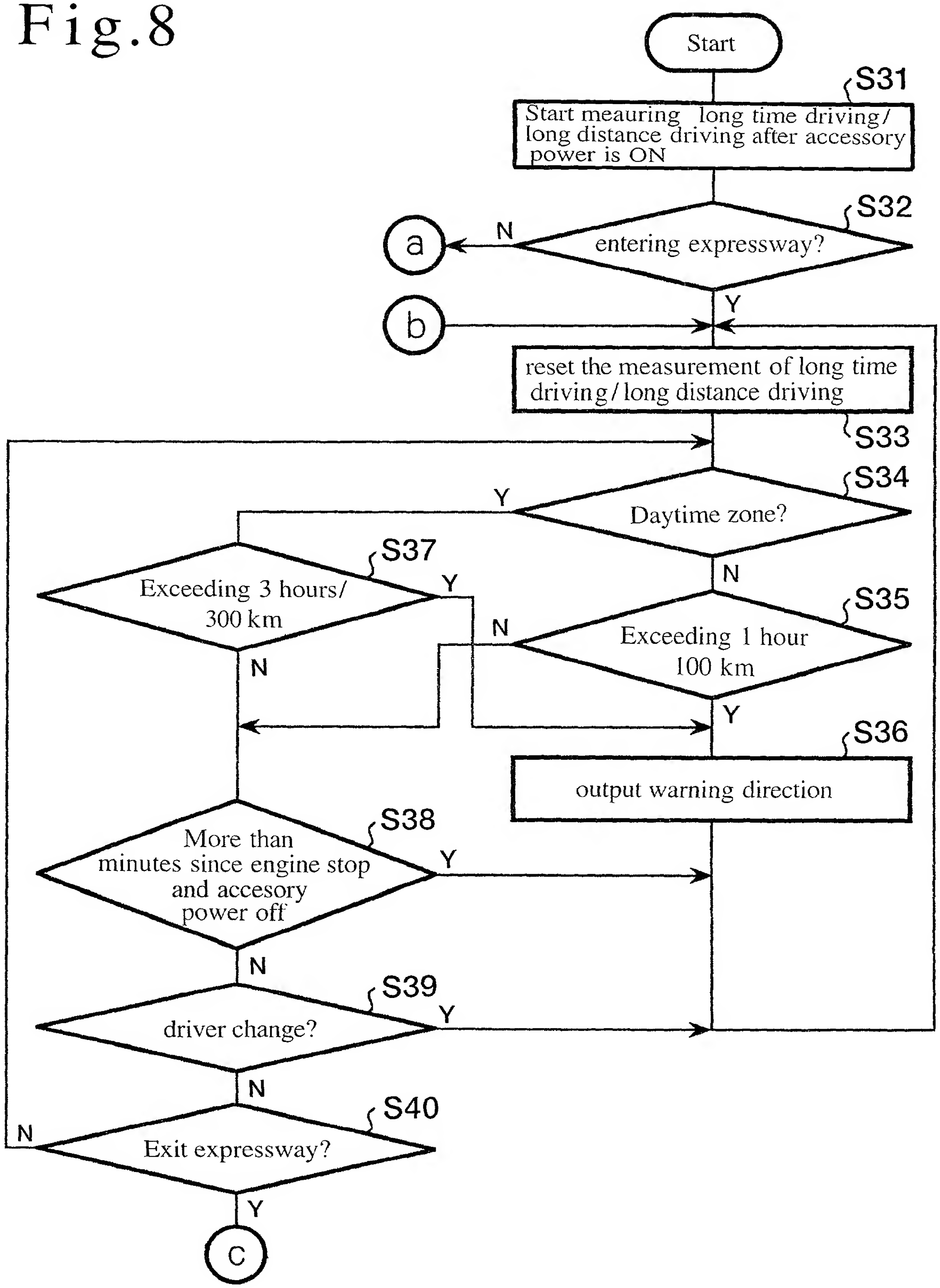
17
14
microphone
voice recognition portion
15
image processor
storage portion
• ROM
• RAM
• VRAM
7
remote control
9
18
6
19
speaker
voice processor
CPU
20
8
liquid crystal disply
GPS receiver
4
continuous driving detection means
21
1
direction sensor
22
13
2
vehicle speed sensor
sensor signal processor
monotory driving detection means
6a
11
communication interface
3
various sensors
driver change detection means
23
5
10
DVD-ROM driver
externlal communication controller

Fig.8



Start
S31
Start meauring long time driving/ long distance driving after accessory power is ON
S32
entering expressway?
N
a
Y
b
reset the measurement of long time driving/long distance driving
S33
S34
Daytime zone?
Y
N
S37
Exceeding 3 hours/ 300 km
Y
N
S35
Exceeding 1 hour 100 km
N
Y
S36
output warning direction
S38
More than minutes since engine stop and accesory power off
Y
N
S39
driver change?
Y
N
S40
Exit expressway?
N
Y
c

Fig.9

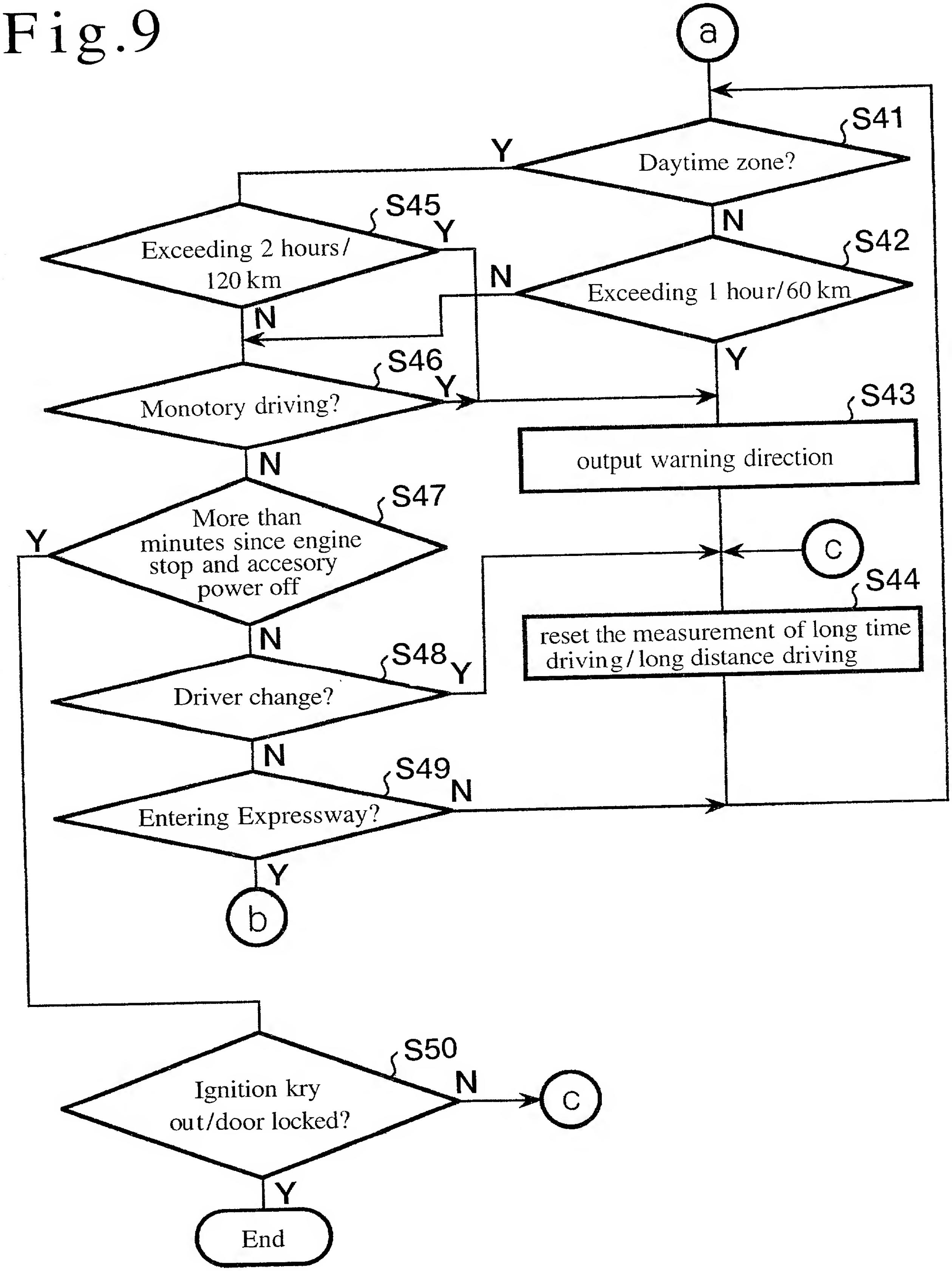


Fig.10

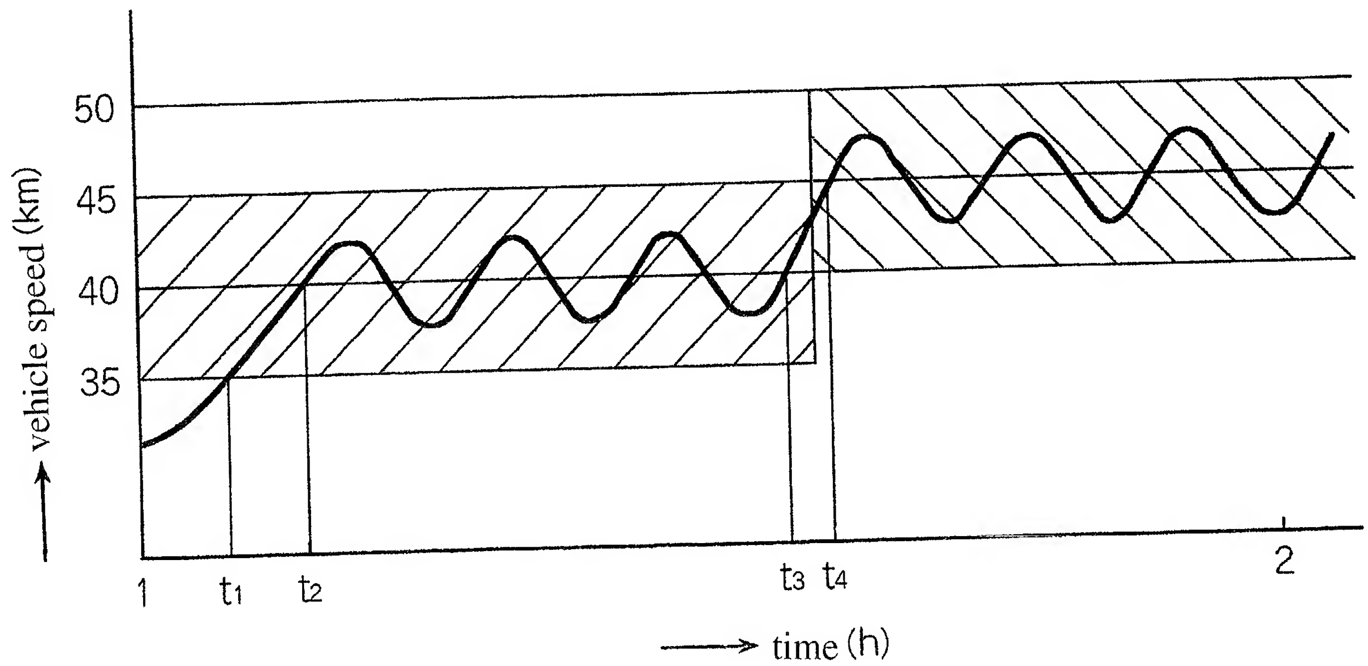
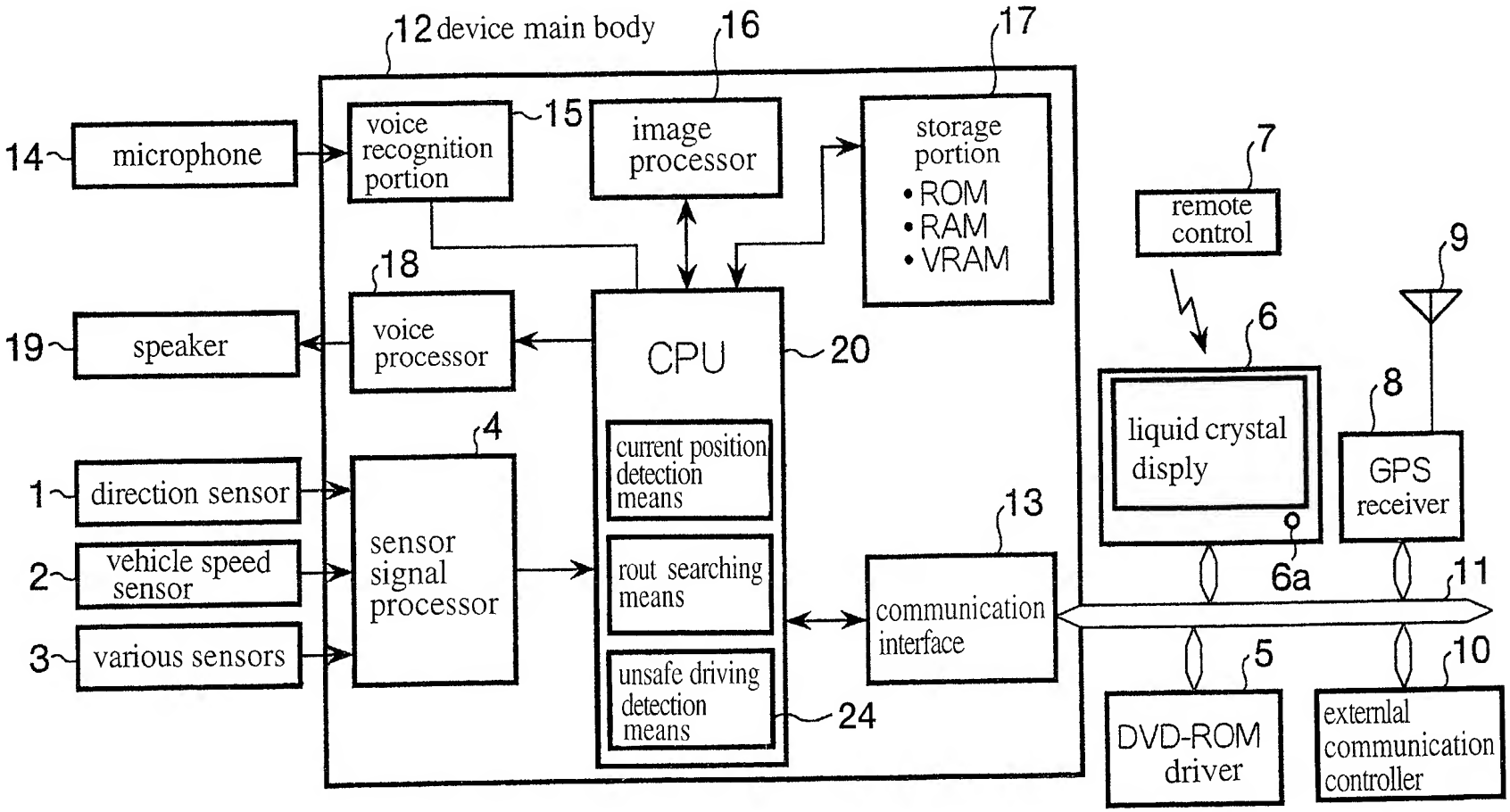


Fig.11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• RAM
• VRAM
7
remote control
18
9
19
speaker
voice processor
CPU
20
6
liquid crystal disply
8
GPS receiver
4
current position detection means
1
direction sensor
13
2
vehicle speed sensor
sensor signal processor
rout searching means
6a
11
3
various sensors
communication interface
5
10
unsafe driving detection means
24
DVD-ROM driver
externlal communication controller

Fig.12(a)

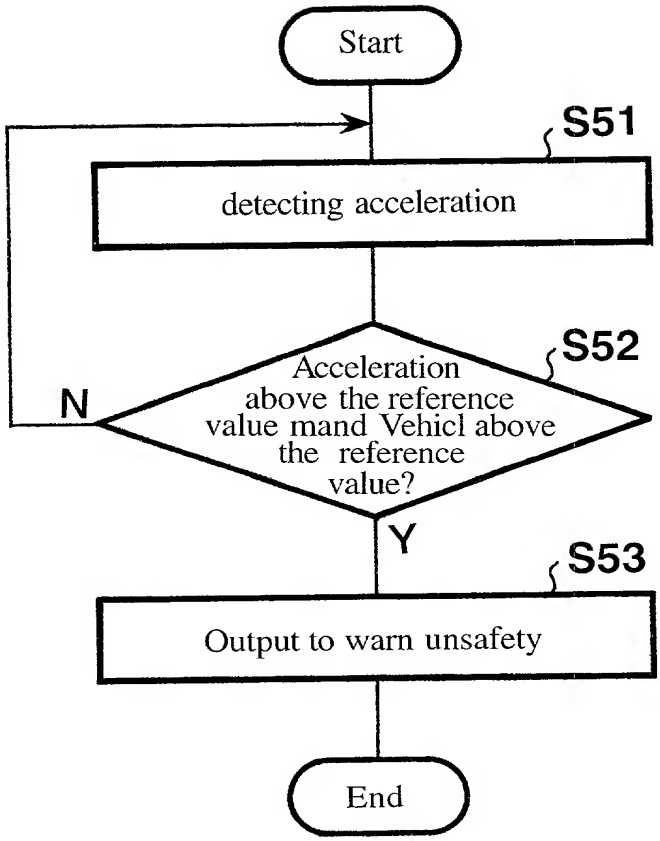


Fig.12(b)

Acceleration ±G	Vehicle speed V
$G \geqq G_1$	$V \geqq V_1$
$G \geqq G_2 > G_1$	$V \geqq V_2 > V_1$
⋮	⋮
$G \geqq G_n > G_{n-1}$	$V \geqq V_n > V_{n-1}$

Fig.13(a)

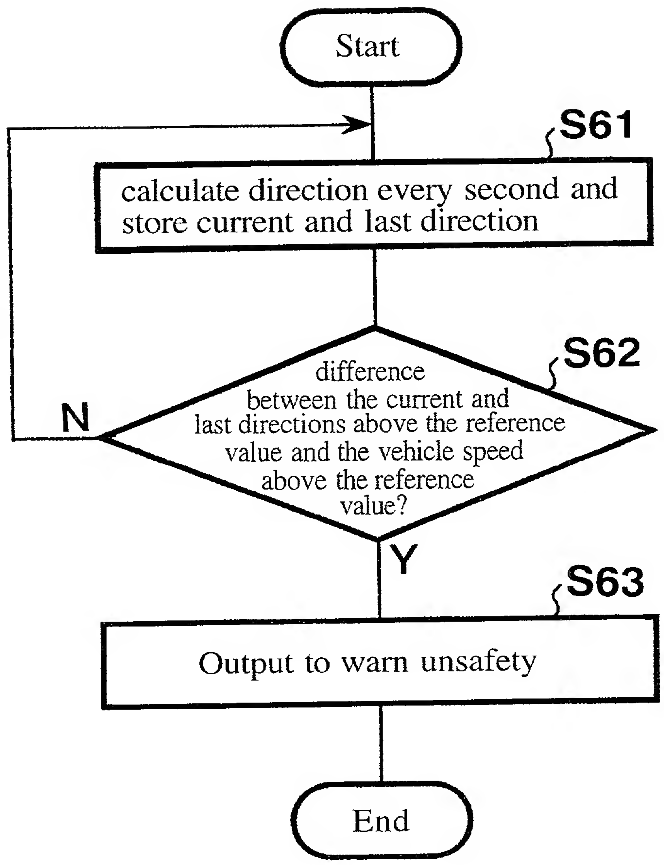
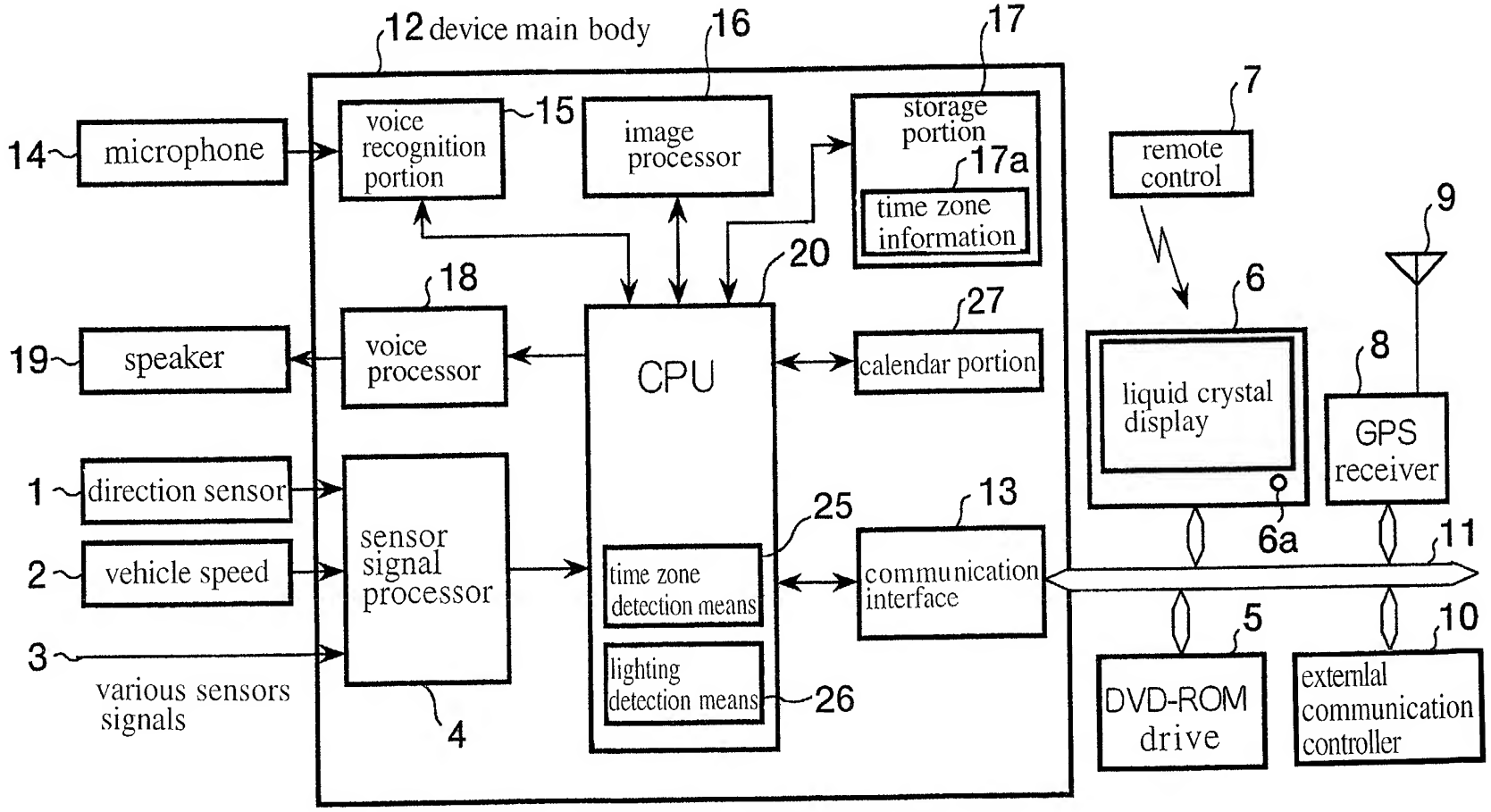


Fig.13(b)

Direction difference Θ	Vehicle speed V
$\theta \geqq \theta_1$	$V \geqq V_1$
$\theta \geqq \theta_2 < \theta_1$	$V \geqq V_2 > V_1$
⋮	⋮
$\theta \geqq \theta_n < \theta_{n-1}$	$V \geqq V_n > V_{n-1}$

Fig.14


12 device main body
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17
14
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voice recognition portion
15
image processor
storage portion
17a
time zone information
7
remote control
9
20
18
6
27
19
speaker
voice processor
CPU
calendar portion
liquid crystal display
8
GPS receiver
1
direction sensor
sensor signal processor
25
13
2
vehicle speed
time zone detection means
communication interface
6a
11
3
various sensors signals
lighting detection means
26
5
10
4
DVD-ROM drive
external communication controller

Fig.15

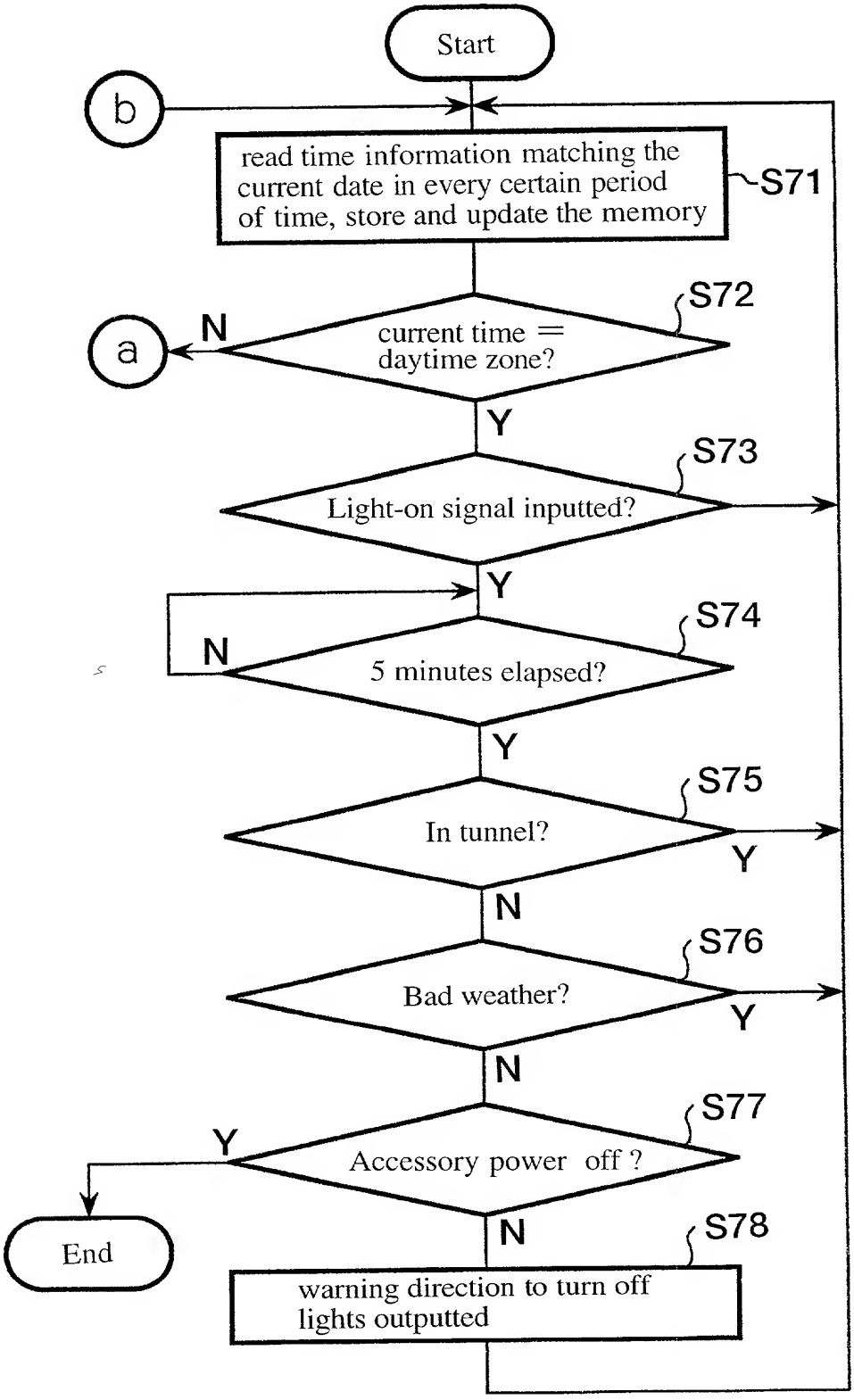
Start
b
read time information matching the current date in every certain period of time, store and update the memory
S71
S72
current time = daytime zone?
N
a
Y
S73
Light-on signal inputted?
Y
S74
N
5 minutes elapsed?
Y
S75
In tunnel?
Y
N
S76
Bad weather?
Y
N
S77
Y
Accessory power off ?
End
N
S78
warning direction to turn off lights outputted

Fig.16

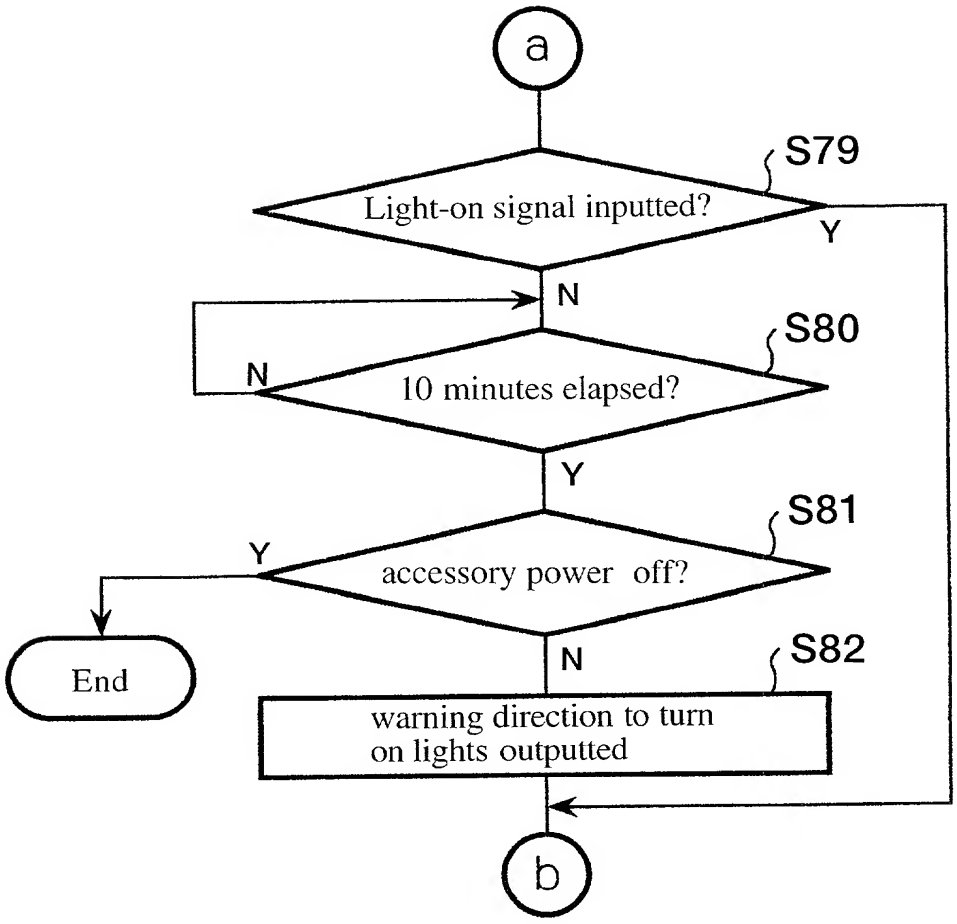

Fig.17

17a

Longitude Lo	139<Lo≦140
Latitude La	34<La≦36
Date	Dec.15~Jan.5
Time zone	AM6:50~PM4:30